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THE ROLE OF ANTHROPOMETRICAL VARIABLES WITH GAME PERFORMANCE OF CRICKET PLAYERS

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ABSTRACT

In the world history, sports was a popular organization and important as today. It has been an interesting aspect for human amusement and a cultural phenomenon at great magnitude. Scientific investigation into the performance of sportsman has been playing an increasingly important role to attain excellence of performance in different sports. Now the sportsman has been able to give outstanding performance because of involvement of new scientifically substantiated training methods and means of execution of sports exercise such as sports techniques and tactics. The purpose of the study is to investigate the difference on body segments and BMI between cricket players.

KEYWORDS: Anthropometric variables, Cricketer, Hockey Player, Height, Weight, BMI Leg Length, Arm Length.

INTRODUCTION

Anthropometry has a rich tradition in sports sciences and sports medicine. Though, in different times, different terms were used like dynamic anthropometry, sports anthropometry, biometry, physiological anthropometry, anthropometrical, kin anthropometry etc. by scientists to establish some relationships between the body structure and the specialized functions required for various tasks. In fact, it is well established that each individual is unique. The extent of human variability is so enormous that no two individuals can ever be exactly the same. There are two fundamental causes for this variation. One is the genes inherited from parents and the other is the infinity of environment which acts upon individuals from cradle to grave. Therefore, scientists have always been fascinated by the phenomenon of human variation. In the populations, the law of chance operates as a whole and people in general tend to fall along a curve of normal distribution on all traits. With the innumerable variety of human physique, it has become a generalized consideration that some sports events are more suitable to individuals with specific physique than others (Reco-Sanz, 1998; Wilmore & Costill, 1999; Keogh, 1999). It has been well established that specific physical characteristics or anthropometric profiles indicate whether the player would be suitable for the competition at the highest level in a specific sport (Claessens et al., 1999; Bourgois et al., 2000, 2001; Reilly et al., 2000; Gabbett, 2000; Ackland et al., 2003; Slater et al., 2005). These anthropometric and morphological parameters are the sensitive indicators of physical growth and nutritional status of the athletes for their maximal performances (Wilmore & Costill, 1999; Chatterjee et al., 2006). Cricket is a field-based popular team game in most Commonwealth countries. In the past, it was played solely within a specific season (winter in Asian countries and summer in western countries). But the game has gained so much popularity in the last few decades that it is now played throughout the year. Cricketers are therefore exposed to more demanding schedules, with longer periods of training and practicing. The increased workload may be one of the contributing factors to the increased incidence of injuries.

Game Performance of Cricket Players

Subjects. The present cross-sectional study is based on purposively selected 98 Indian inter-university male cricketers aged 16-25 years (mean age 21.03 years, ± 1.72). The competition included nine Indian universities namely, Punjabi University, Patiala, Punjab University, Chandigarh, Guru Nanak Dev University, Amritsar, Punjab Agricultural University, Ludhiana, Kurukshrata University, Kurukshratra, Guru Jambeswar University, Hisar, Jammu University, Jammu, Himachal Pradesh University, Himachal Pradesh and Delhi University, Delhi, and the competition was organized in Guru Nanak Dev University, Amritsar, Punjab, India. An adequate number of controls (n = 99, mean age 21.50 years, ± 1.13) with no particular playing background were also collected from the same place for comparisons. The age of the subjects were recorded from the date of birth registered in their respective institutes. The subjects were divided in such a way that age 16 refers to the individuals aged 15 years and 6 months through 16 years and 5 months and 29 days. The subjects were further subdivided into three age groups, viz. 16 - 18 years, 19 - 21 years and 22 - 25 years for further analyses. A written consent was obtained from the subjects. The data were collected under natural environmental conditions in morning (between 8 AM. to 12 noon). The study was approved by the local ethics committee. Anthropometric Measurements Twelve anthropometric characteristics, viz. height, weight, BMI, thigh length, lower leg length, total leg length, mid thigh, calf and hip circumferences, bi-acromial breadth, percent body fat and back strength were taken on each subject using the techniques provided by Lohmann et al. (1988) and were measured in triplicate with the median value used as the criterion. The height was recorded during inspiration using a stadiometer (Holtain Ltd., Crymych, Dyfed, UK) to the nearest 0.1 cm. The subject was asked to stand erect on the stadiometer with bare foot. The horizontal bar of the stadiometer was placed on the vertex of the subject and the readings were recorded. Weight was measured by digital standing scales (Model DS-410, Seiko, Tokyo, Japan) to the nearest 0.1 kg. The Koley S. / Anthropometric characteristics of indian inter-university cricketers University of Alicante subject was asked to stand erect on the digital weighing machine with minimum cloths and bare foot. The readings were recorded from the scales of the digital weighing machine. BMI was then calculated using the formula weight (kg)/ height (m)2. Mid thigh, calf and hip circumferences were measured by a flexible metallic tape (Holtain Ltd) from the right side of the subject. Percent body fat was assessed using skinfold measurements taken from four sites, viz. biceps (over the biceps muscle), triceps (over the triceps muscle), subscapular (below the inferior angle of the scapula) and calf (over the calf muscle) using Harpenden skinfold caliper (Holtain Ltd, Crosswell, Crymych, UK) to the nearest 0.2 mm, and using the equation of Slaughter et al. (1988). Back strength measurement Back strength was measured using a back-leg-chest dynamometer. After 3 minutes of independent warm up, the subject was positioned with body erect and knees bent on the back-leg chest dynamometer so that grasped-hands of the subject rests at proper height. Then straightening the knees and lifting the chain of the dynamometer, pulling force was applied on the handle. The body would be inclined forward at an angle of 60 degrees for the measurement of back strength. The strength of the back muscles was recorded on the dial of the dynamometer at the best of three trials in kg. Thirty seconds time interval was maintained between each back strength testing. The instrument was calibrated prior to use. Statistical Analysis Standard descriptive statistics (mean ± standard deviation) were determined for directly measured and derived variables. Student's t-test was used for the comparison of various anthropometric variables between cricketers and controls. One way analysis of variance was tested for the age-wise comparisons of data among Indian inter-university male cricketers and controls, followed by post-hoc Bonferroni test. Pearson's correlation coefficients were applied to establish the relationships among the variables measured. Data were analyzed using SPSS (Statistical Package for Social Science) version 17.0. A 5% level of probability was used to indicate statistical significance. RESULTS Descriptive statistics of anthropometric characteristics in cricketers and controls are shown in Table 1. Statistically significant differences ($p \leq 0.05$ - 0.000) were noted in weight, BMI, thigh length, total leg length, calf and hip circumferences, percent body fat and back strength between cricketers and controls. One way analysis of variance showed significant differences ($p \leq 0.01$ - 0.000) in all the variables studied (except mid thigh circumference) in cricketers of age groups 16 - 18 years, 19 - 21 years and 22 - 25 years and their respective age group-matched control counterparts (Table 2). Bivariate correlations of the anthropometric traits were examined in Indian inter-university male cricketers in Table 3. Height has significantly positive correlations ($p \leq 0.01$) with all the variables studied (except BMI and mid-thigh circumference), weight with all the variables (except thigh length and back strength), BMI with mid-thigh circumference, hip circumference, calf circumference, bi-acromial breadth and percent body fat. Thigh length has significantly positive correlations ($p \leq 0.01$) only with lower leg length and total leg length. Lower leg length has significantly positive correlated ($p \leq 0.05$ - 0.01) with total leg length and calf circumference, and negative correlation with percent body fat. Total leg length has significantly negative correlation ($p \leq 0.05$) only with percent body fat. In circumferential measurements, mid-thigh circumference has significantly positive correlation ($p \leq 0.05$ - 0.01) with hip circumference, calf circumference, bi-acromial breadth and percent body fat; hip circumference with calf circumference, bi-acromial breadth and percent Koley S. / Anthropometric characteristics of indian inter-university

CONCLUSIONS

As, I have an experience in physical director in G S G College Kamalapur, I have an great experience that, the Cricket is a game of endurance, also is played throughout the year. Thus demand of physical fitness of the players is the prime. It is well established that anthropometric analysis of different sports has shown optimum performance appears to have definite physical. In the present study, apart from conventional anthropometric variables, estimation of back strength was done to assess the strength of the back muscles of the cricketers. The findings of the present study indicated greater back strength in cricketers than controls. Greater back strength in cricketers was probably due to the effect of strenuous training program and was useful to generate more forces in them during game. The energy generated in the lower extremities during throwing action gets transferred to the shoulder and ultimately to the ball through kinetic chain. This helps in increasing the force, because lower extremities are larger body parts and generate more energy than the shoulder joint. This article focus on the data presented in the present study carry immense practical application and should be useful in future investigation on player selection, talent identification in cricket and training program development.

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